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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,845	10/20/2003	Karen S. Lyons	84632-US1	2813
26384 7590 03/23/2007 NAVAL RESEARCH LABORATORY ASSOCIATE COUNSEL (PATENTS) CODE 1008.2 4555 OVERLOOK AVENUE, S.W. WASHINGTON, DC 20375-5320			EXAMINER DOVE, TRACY MAE	
			ART UNIT 1745	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/23/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/693,845

Applicant(s)

LYONS ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

This Office Action is in response to the communication filed on 1/5/07. Applicant's arguments have been considered, but are not persuasive. Claims 1-18 are pending. This Action is FINAL.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 10-12, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al., Preparation of Dispersed Platinum on Conductive Tin Oxide and Its catalytic Activity for Oxygen Reduction, J. Electrochem. Soc., 130(1), 1/1983.

Watanabe teaches a Pt-SnO<sub>2</sub> catalyst material (page 63). The SnO<sub>2</sub> is subjected to an alkaline pretreatment that cause the pH response of the electrode to be enhanced through hydration (yH<sub>2</sub>O). The pretreatment enhances the chemisorption on SnO<sub>2</sub>. The adsorption occurs on SnO<sub>2</sub> only on surfaces which have been hydrated (col. 1, page 60). The platinum is highly dispersed on tin oxide through chemisorption. The Pt-SnO<sub>2</sub> catalyst material is used for an electrode for catalyzing oxygen reduction in alkaline solution (abstract).

Thus the claims are anticipated.

\*

Claims 1, 2, 4, 5, 12, 13, 15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Gardner et al., Characterization Study of Silica-Supported Platinized Tin Oxide

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Catalysts Used for Low-Temperature CO Oxidation: Effect of Pretreatment Temperature, J.

Phys. Chem. 1991, 95:2.

Gardner teaches Pt/SnO<sub>2</sub> surfaces supported on SiO<sub>2</sub>. The SnO<sub>2</sub> may be partially reduced to SnO (abstract). Pt/SnO<sub>2</sub> is humidified and a silica support improves the performance of Pt-SnO<sub>2</sub> surfaces by preventing extensive surface dehydration and consequent activity loss (page 835). Thus the claims are anticipated.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 4-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., US 5,922,487 ("Watanabe 487") in view of Watanabe et al., Preparation of Dispersed Platinum on Conductive Tin Oxide and Its catalytic Activity for Oxygen Reduction, J. Electrochem. Soc., 130(1), 1/1983.

Watanabe 487 teaches an electrode catalyst for a fuel cell comprising an alloy essentially consisting of at least one of tin, germanium and molybdenum, and one or more noble metals selected from platinum, palladium and ruthenium (abstract). The electrocatalyst alloy essentially consists of 1-60 atomic % of tin and the balance of one or more noble metals (Pt) (2:50-52). The catalyst comprises a support such as carbon black and platinum is supported thereon. The platinum is coated with tin hydroxide which is converted to tin oxide (3:48-60). Example 5 teaches a fuel cell comprising an electrode comprising the Pt/Sn carbon supported catalyst, a

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cathode and a perfluorocarbon ion exchange membrane. The platinum carbon catalyst is 30 wt% platinum and 70 wt% carbon support.

Watanabe does not explicitly teach a  $\text{Pt-SnO}_x\text{H}_2\text{O}$  catalyst material.

However, Watanabe teaches a  $\text{Pt-SnO}_2$  catalyst material (page 63). The  $\text{SnO}_2$  is subjected to an alkaline pretreatment that cause the pH response of the electrode to be enhanced through hydration ( $\text{yH}_2\text{O}$ ). The pretreatment enhances the chemisorption on  $\text{SnO}_2$ . The adsorption occurs on  $\text{SnO}_2$  only on surfaces which have been hydrated (col. 1, page 60). The platinum is highly dispersed on tin oxide through chemisorption. The  $\text{Pt-SnO}_2$  catalyst material is used for an electrode for catalyzing oxygen reduction in alkaline solution (abstract).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Watanabe teaches the  $\text{Pt-SnO}_2$  (hydrated) system may be used as a replacement for platinum metal as a catalyst. One of skill would have been motivated to use the  $\text{Pt-SnO}_2$  (hydrated) catalyst of Watanabe to replace the platinum catalyst material of Watanabe 487 because Watanabe clearly suggests as much.

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Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., Preparation of Dispersed Platinum on Conductive Tin Oxide and Its catalytic Activity for Oxygen Reduction, J. Electrochem. Soc., 130(1), 1/1983 in view of Katayama, Electrooxidation of Methanol on a Platinum-Tin Oxide Catalyst, J. Phys. Chem, 1980, 84:4.

Watanabe teaches a  $\text{Pt-SnO}_2$  catalyst material (page 63). The  $\text{SnO}_2$  is subjected to an alkaline pretreatment that cause the pH response of the electrode to be enhanced through hydration ( $\text{yH}_2\text{O}$ ). The pretreatment enhances the chemisorption on  $\text{SnO}_2$ . The adsorption

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occurs on SnO<sub>2</sub> only on surfaces which have been hydrated (col. 1, page 60). The platinum is highly dispersed on tin oxide through chemisorption. The Pt-SnO<sub>2</sub> catalyst material is used for an electrode for catalyzing oxygen reduction in alkaline solution (abstract).

Watanabe does not explicitly state the amount of platinum. However, Katayama teaches a platinum-tin oxide catalyst (abstract). The Pt/SnO<sub>2</sub> catalyst may be up to 16 atom% platinum (page 378). Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use a conventional amount of platinum for the Pt-SnO<sub>2</sub> catalyst material of Watanabe.

\*

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al., Characterization Study of Silica-Supported Platinized Tin Oxide Catalysts Used for Low-Temperature CO Oxidation: Effect of Pretreatment Temperature, J. Phys. Chem. 1991, 95:2 in view of Katayama, Electrooxidation of Methanol on a Platinum-Tin Oxide Catalyst, J. Phys. Chem, 1980, 84:4.

Gardner teaches Pt/SnO<sub>2</sub> surfaces supported on SiO<sub>2</sub>. The SnO<sub>2</sub> may be partially reduced to SnO (abstract). Pt/SnO<sub>2</sub> is humidified and a silica support improves the performance of Pt-SnO<sub>2</sub> surfaces by preventing extensive surface dehydration and consequent activity loss (page 835). Gardner does not explicitly state the amount of platinum. However, Katayama teaches a platinum-tin oxide catalyst (abstract). The Pt/SnO<sub>2</sub> catalyst may be up to 16 atom% platinum (page 378). Therefore, the invention as a whole would have been obvious to one having ordinary

skill in the art at the time the invention was made because one of skill would have been motivated to use a conventional amount of platinum for the Pt-SnO<sub>2</sub> catalyst material of Gardner.

***Response to Arguments***

Applicant's arguments filed 1/5/07 have been fully considered but they are not persuasive.

Applicant argues Watanabe does not disclose the composition comprises a hydrate, as required by the claimed invention. However, Watanabe teaches the tin oxide is subjected to hydration. Hawley's Chemical Dictionary defines hydration as the reaction of molecules of water with a substance in which the H-OH bond of water is not split. The products of hydration are called hydrates. In formulas of hydrates, the addition of the water molecules is conventionally indicated by a centered dot (page 611). Thus one of skill would have concluded the tin oxide subjected to hydration in Watanabe could have been written as SnO<sub>x</sub>·yH<sub>2</sub>O because by definition the hydration of tin oxide results in a hydrate compound.

Applicant argues Gardner does not disclose the hydrate compound of the claimed invention because dehydration of the compound of Gardner does not imply that the material had been a hydrate. Examiner disagrees. Hawley's Chemical Dictionary discloses dehydration is the removal of one or more molecules of water from a chemical compound. Hawley's discloses the term dehydration is not applied to the loss of water by evaporation or sun-drying (pages 349-350). Therefore, one of skill would have concluded that the compound of Gardner was necessarily a hydrate.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 21, 2007



TRACY DOVE  
PRIMARY EXAMINER